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GOVERNMENT DOCUMENTS

REPORT TO THE TOWNSHIP OF GLANBROOK
ON THE
WATER MANAGEMENT IMPLICATIONS OF A
CHANGE IN THE REGULATORY FLOOD STANDARD

INTRODUCTION

The present Provincial Flood Plain standards define the regulatory flood, in the Niagara Peninsula (zone 1), to be the greater of the Hurricane Hazel or the 100 year flood event. For most watersheds within the jurisdiction of the Niagara Peninsula Conservation Authority, the flood resulting from the Hurricane Hazel storm event is greater. As such, this Authority's regulations under The Conservation Authorities Act presently deal with flood plains as generated by the Hurricane Hazel storm event.

The Regional Municipality of Niagara, representing member municipalities within the Niagara Peninsula Conservation Authority's jurisdictional area, has applied to the Ministry of Natural Resources to consider a reduction of the existing regulatory flood standard to the minimum acceptable level being, the 100 year flood. This document has been prepared to provide the Township of Glanbrook with information on the water management implications resulting from a change in the regulatory flood standard in watersheds within their jurisdiction.

It should be noted at this time that a reduction in criteria does not alter the flood susceptibility of a particular site but rather, increases the level of acceptable risk to potential flooding of the site.

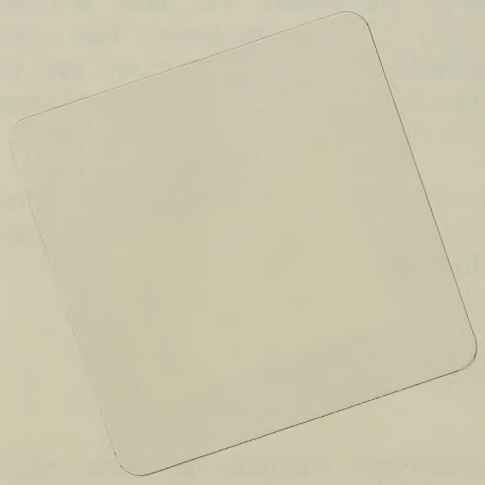
EXISTING WATERSHEDS WITHIN THE TOWNSHIP OF GLANBROOK

The attached plan of the Township of Glanbrook highlights the major watercourses partially or entirely contained within the Township limits.

Tables 1 and 2 summarize several watershed characteristics including drainage area, watercourse length, overall gradient and soils information for each watercourse. This information is presented to illustrate and compare the physical differences between the major watersheds within the Township of Glanbrook.

HISTORY OF FLOODING

In an effort to obtain information on past history of flooding within the Township of Glanbrook, Authority staff reviewed historical flooding reports, newspaper articles and other available sources. In addition, discussions were held with municipal staff, general public and/or other public agencies, on their recollection of past flooding.



The available historic information on past flooding in the Township of Glanbrook was found to be limited to the rainfall/snowmelt event on the Welland River during the period of February 23-25, 1985. During this event, flooding occurred at the Highway #6 overpass. Vehicle traffic was interrupted due to this condition.

In general, based on the lack of recorded historical flood information, it is evident that major flooding problems have not occurred within the Township of Glanbrook (Niagara Peninsula Conservation Authority jurisdiction).

TIME TO PASS FLOOD FLOWS

The time to pass flood flows could not be generalized based on observed data, due to the lack of historical flooding information. The relatively mild slopes of the watersheds in the area indicated, however, that long duration, wide spread flooding would be the predominate characteristic of a flood event.

WATERSHED URBAN DEVELOPMENT

The attached tables outline, in general terms, the percentage of each watershed presently developed. In addition, based on the municipal Official Plan (1985), the table indicates the percentage of rural land left to be developed and the total percent of each watershed which will ultimately be developed.

Since the potential for further urban growth is evident in some areas, any decisions on flood plain management criteria have the potential to affect not only existing development, but in addition, new development proposals in the vicinity of watercourses and their flood plains.

From discussions with municipal staff on September 30, 1986, the Niagara Peninsula Conservation Authority was able to determine that the average overall rate of development within the Township of Glanbrook is approximately 0.03 percent of the total land area per year. This estimate is based on the average number of building permits (excluding additions) issued over the 6 year period from 1980 to 1985 and the assumption that a single building permit creates, on the average, 0.75 acres of developed land. This average was based on typical building areas, roadways, driveways, etc. to service each site.

As no 1:100 year flood level information is available within the Town of Glanbrook, the change in flood elevations or extent of flood plains as a result of reduction of criteria cannot be determined. Based on watercourse information in adjacent municipalities, it is our opinion that a measurable reduction in the regulated flood plain would be achieved through a change in criteria.

REQUIRED CHANGES

The following outlines the changes required in both municipal documents and flood plain mapping to effect the change in the regulatory flood standard.

Based on existing municipal planning documents, all schedules and policies of the Official Plan and restricted area zoning by-laws must be amended to reflect the new criteria.

The final items of Table 2 refer to the status of flood plain mapping for watercourses in Glanbrook. It is apparent that remapping of the Welland River and Twenty Mile Creek will be required since the available flood level information is restricted to the Regional Storm event. It should be noted that 1:100 year flow (but not flood levels) information is available for the Welland River. As such, remapping efforts would be reduced to the calculation of water levels only, in this case.

No other watercourses have calculated flood lines and as such, a reduction in criteria will therefore not directly affect these areas at this time.

FUNDING IMPLICATIONS

As previously indicated, 2 watercourses within the Township of Glanbrook have been floodline mapped, the Welland River and Twenty Mile Creek.

In order to update the information on these watercourses to reflect a change in criteria, new flow (Twenty Mile Creek only) and resulting floodlines (Twenty Mile Creek and Welland River) will be required for the 1:100 year flood event. Funding for watercourse mapping or remapping would be subject to availability under the current Canada/Ontario Flood Damage Reduction Program.

Approved mapping projects under this program would be funded at the contribution rate of 50% Federal Government, 40% Provincial Government and 10% Conservation Authority (special municipal levy to the Township of Glanbrook). It is anticipated that the Niagara Peninsula Conservation Authority will initially prepare mapping project submissions for remapping of the above watercourses in the event that the criteria reduction is approved.

Cost implications to the municipality to maintain the current level of floodplain information at a reduced standard are therefore summarized as follows.

a) Remapping of the Welland River and Twenty Mile Creek (10% of total project cost).

b) Required costs to amend all appropriate municipal planning documents.

CONCLUSIONS

The following general conclusions have been derived from the previous discussions.

1) For the most part, all watercourses within the Township of Glanbrook have the physical characteristics of sloping mildly. This characteristic is an important consideration in the analysis of the time required for the passage of flood flows as well as for flood forecastings.

2) Existing and past flooding problems suggest that no flood event ever exceeded the 100 year standard.

3) Sufficient existing information exists whereby a criteria reduction could be implemented. The major changes required would be in the preparation of amendments to municipal planning documents and remapping of two watercourses.

4) The municipality is encouraged to support further mapping studies in areas of existing development and those under development pressure.

NIAGARA PENINSULA CONSERVATION AUTHORITY

PLANNING INFORMATION

Table 1

NAME OF WATERCOURSE	WATERSHED CHARACTERISTICS	% OF WATERSHED PRESENTLY URBANIZED (A)*	% OF WATERSHED PROPOSED TO BE URBANIZED (B)	TOTAL % OF WATERSHED TO BE DEVELOPED (A & B)	HISTORICAL FLOODING
Wolf Creek	-Mild gradient (0.0019 m/m) Soils predominantly silty clay & silty clay loam	0.0%	0.0%	0.0%	
20 Mile Creek	-Mild gradient (0.0014 m/m) -Soils predominantly silty clay loam, silty loam, and silty clay	3.2%	3.3%	6.5%	—
Welland River	-Very mild gradient (0.0006 m/m) -Soils predominantly, silty clay and silty clay loam	6.3%	6%	12.3%	See attached report

All others

* Remainder of land being used for Open Space/Rural

** Based on Municipal Official Plan prepared in 1985 (and updated through discussions with municipal staff).

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TECHNICAL INFORMATION

Table 2

NAME OF WATERCOURSE	WATERSHED AREA HECTARES	LENGTH OF WATERCOURSE (MAIN BRANCH) (KM)	AVERAGE CHANGE IN FLOOD ELEVATION FROM REGIONAL TO 100 YEAR EVENTS	% REDUCTION OF FLOOD PLAIN	APPROXIMATE # OF STRUCTURES REMOVED FROM FLOOD PLAIN (# STRUCTURES ABOVE 100 YEAR)	STATUS OF FLOOD PLAIN MAPPING	
						AVAILABLE INFORMATION (FLOOD LINES)	YEAR ENGINEERING STUDY COMPLETED
Wolf Creek	2,512	14.7					
20 Mile Creek	22,869	91				Regional	1980
Welland River	28,267	132			N/A (Total for watercourse 297)	Regional and 100 year (flows only)	1980
All Others							

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